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them look fatter and larger than really they are for the purpose of sale; the selling of moldy, fermented, decomposed and misbranded grains; the offering to the people of glucose under the name of "corn syrup," thus taking a name which rightfully belongs to another product made directly from Indian corn silks.

The official toleration and validation of such practises have restricted the activities of the Bureau of Chemistry to a very narrow field. As a result of these restrictions, I have been instructed to refrain from stating in any public way my own opinion regarding the effect of these substances upon health, and this restriction has conflicted with my academic freedom of speech on matters relating directly to the public welfare.

These restrictions culminated in the summer of 1911 with false charges of misconduct made against me by colleagues in the Department of Agriculture, which, had it not been for the prompt interference on the part of the President of the United States, to whom I am profoundly grateful, would have led to my forcible separation from the public service. After the President of the United States and a committee of Congress, as a result of investigation, had completely exonerated me from any wrongdoing in this matter, I naturally expected that those who had made these false charges against me would no longer be continued in a position which would make a repetition of such action possible. The outcome, however, has not sustained my expectations in this matter. I was still left to come into daily contact with the men who secretly plotted my destruction.

I am now convinced that the freedom which belongs to every private American citizen can be used by me more fruitfully in rallying public opinion to the support of the cause of pure food and drugs than I could with the limited activity left to me in the position which I have just vacated. I propose to devote the remainder of my life, with such ability as I may have at my command and with such opportunities as may arise, to the promotion of the principles of civic righteousness and industrial integrity, which underlie

the food and drugs act, in the hope that it may be administered in the interest of the people at large, instead of that of a comparatively few mere manufacturers and dealers.

This hope is heightened by my belief that a great majority of manufacturers and dealers in foods and drugs are heartily in sympathy with the views I have held and that these views are indorsed by an overwhelming majority of the press and the citizens of the country. In severing my official relations with the Secretary of Agriculture I take this opportunity of thanking him for the personal kindness and regard which he has shown me during his long connection with the department. I can not leave the Bureau of Chemistry without expressing to my assistants of all grades my appreciation of their loyalty and devotion to me.—Statement by Dr. H. W. Wiley.

SCIENTIFIC BOOKS

A Descriptive Catalogue of the Higher Groups, Genera, Species and Subspecies of Birds known to occur in North America, from the Arctic Lands to the Isthmus of Panama, the West Indies and other Islands of the Caribbean Sea, and the Galapagos Archipelago. By ROBERT RIDGWAY, Curator of the Division of Birds. Part V. [Containing] Family Pteroptrochidæ—The Tapacolas. Family Formicariidæ—The Antbirds. Family Furnariidæ—The Ovenbirds. Family Dendrocolaptidæ—The Woodhewers. Family Trochilidæ—The Humming Birds. Family Micropodidæ—The Swifts. Family Trogonidæ—The Trogons. Washington: Government Printing Office. 1911. Bulletin of the United States National Museum. No. 50. Part V. "Issued November 29, 1911." 8vo. Pp. xxiii + 859; pls. xxxiii. Part V. of Ridgway's monumental work on the birds of north and middle America completes the first two thirds of this great undertaking, Part I. of which appeared in October, 1901. As Part IV. was issued in 1907, a longer interval than usual has elapsed between the appearance of Parts IV. and V., due in

part to interruptions by field work and illness, and in part to the preparation of matter originally intended, and even put in type for the present volume, but which it was found would too greatly increase its size. This matter, embracing the large family of Woodpeckers, will appear in Part VI., now in an advanced stage of preparation.

The present volume includes seven families, five of which are exclusively American, four of them being very numerous in species and subspecies. These are the Pteroptochidæ (with only one species in the geographical area of the present works), the Formicariidæ (66 species and subspecies), the Furnariidæ (29 species and subspecies), the Dendrocolaptidæ (41 species and subspecies) and the Trochilidæ (174 species and subspecies). The other two families included are the Micropodidæ (25 species and subspecies) and the Trogonidæ (23 species and subspecies), the first of wide distribution throughout the world, the other common to all tropical regions. The same careful treatment in respect to technical details that has characterized the previous volumes is still maintained, as are the bibliographic references, which give at a glance the history of the species and higher groups as treated by preceding authors. The "keys" include many extra-limital genera and species, thus greatly widening the scope of the work as announced on the title page. There is a tendency to recognize as genera many groups usually treated as subgenera or altogether ignored; they are as a rule natural groups and their recognition in nomenclature is consistent with the present almost universal tendency to differentiate slight geographical forms as worthy of recognition as subspecies.

As heretofore, the work is based upon the material of the United States National Museum plus that of all the principal collections, private as well as public, in this country, the specimens examined in preparing the present volume numbering 14,358, of which about 6,000 are in the joint collections of the National Museum and Biological Survey. Of the more than 8,000 borrowed specimens, nearly all were furnished by three institutions,

the Museum of Natural History in New York, the Museum of Comparative Zoology at Cambridge and the Carnegie Museum of Pittsburgh. Through this system of cooperation the leading museums are benefited as well as the author, since the loaned material is returned bearing the identifications of the leading expert on the subject, and in addition the results of the author's investigations as here set forth are more comprehensive and rest on a firmer basis than would otherwise be possible. With even these resources the author has to regret that in several of the families a number of genera and very many species were not available for examination, so his "effort to bring order out of chaos can be considered as only partially successful."

While the scope of the work is restricted to the technicalities of the subject, references are made to nests and eggs "where some particular style of nest or coloration of eggs is characteristic of a group (family or genus), as a sort of accessory or supplemental group character." A paragraph is also given in the description of each family to a statement respecting the range in size, character of plumage, manner of life and nature of the food of the species, as well as their number and geographical distribution. Thus under the family Trochilidæ are some items of information not generally known even to all ornithologists, and much less to the general reader.

"Inhabitants exclusively of America, the Humming Birds constitute not only the most charming element in the wonderfully varied bird-life of the Western Hemisphere, but, also, without doubt, the most remarkable group of birds in the entire world. No other group of birds is so brilliant in plumage or so different from all others in their mode of flight and manner of feeding. The general habits of Humming Birds are not dissimilar to those of birds in general. They are both aerial and arboreal, but are unable to progress upon the ground or any flat surface by means of their legs and feet alone. They perch readily and frequently upon trees or bushes, or may even cling to rocks or other vertical surfaces; and

their nidification presents nothing that may be deemed peculiar or even specially characteristic. In their flight and manner of procuring their food, however, they differ strikingly from all other birds, in these respects closely resembling certain insects, especially the crepuscular hawkmoths (Sphingidæ). Their food, consisting mainly of small insects, but in part also of the nectar of flowers, is mostly gleaned from blossoms, before which they poise, with wings so rapidly vibrating as to be invisible except as a dim haze or halo partly surrounding the body and producing the humming sound from which these birds derive their vernacular name, the bill thrust inside the flower and the slender, semitubular tongue extended into the depths of the blossom. Some species, instead of feeding from flowers, glean their insect food from the bark of forest trees, following along the branches in suspended flight in the same manner that the others pass from flower to flower. In their feeding from flower to flower, Humming Birds, like bees, butterflies, and moths, perform the same office in the economy of nature as insects by transferring pollen from one bloom to another, and thus assisting in the fertilization of plants. In flying from one point to another, the flight of Humming Birds, while essentially direct, is usually more or less undulating, and so extremely rapid that the eye can scarcely follow. Often this flight is accompanied (at least in the case of males of some species) by a more or less remarkable screeching or grating sound, produced mechanically by some peculiarity of wing-structure.

"Diminutiveness of size and metallic brilliancy of coloring are the chief external characteristics of Humming Birds, though exceptions to both occur; and in these respects they, as a group, have no rivals. Unfortunately, stuffed specimens convey but a faint idea of their splendid coloring, for the perfection of their changeable refulgence can be fully realized only in the living bird, whose every change of position flashes to view a different hue—emerald green replacing ruby red, sapphire blue succeeding fiery orange, or either becoming opaque velvety black—according to

the angle at which the sun's rays touch the feathers, an effect which can only partially be imitated with the stuffed specimen by artificially changing its position with reference to the light. Many species have a spot of the most luminous or brilliantly metallic color (usually green) that it is possible to imagine on the forehead at the base of the bill, this spot being surrounded by the most intense velvety black—evidently to enhance the brilliancy of the ornament by contrast, just as a jeweler would, for the same purpose, display a diamond or other gem against a background of black velvet. Often there is a spot of brilliant color and one of a contrasting hue just below it, the result being that first one color, then the other, is flashed forth as the bird changes slightly its position."

The thirty-one plates give the structural details of bill, wings, tail and feet of each of the 121 genera, thus greatly facilitating identification. It is hoped that Part V. may be followed in due time by the remaining volumes of this invaluable work, so indispensable to all students of American birds.

J. A. ALLEN

The Hindu-Arabic Numerals. By DAVID EUGENE SMITH and LOUIS CHARLES KARPINSKI. Boston and London, Ginn and Company. 1911. Pp. vi + 160.

This book gives in compact form a readable and carefully prepared account of the numerous researches which have been made in the endeavor to trace the origin and development of the Hindu-Arabic numerals. Teachers of mathematics will welcome it, while students specializing in the history of mathematics will derive great help from the many bibliographical references to other publications on this subject. Like the arithmetician Tostall the authors read everything in every language and spent much time in licking what they found into shape *ad ursi exemplum*, as the bear does her cubs. But it would not be a correct statement, were we to convey the idea that the book does not embody original research. In several cases the authors have been able to correct mistakes of earlier writers